REMARKS

This Amendment cancels claims 2-4 and amends claim 1, 7 and 13 in accordance with the original disclosure. In view of these amendments and the following remarks, Applicants submit that all of pending claims 1, 5-20 and 23-32 are now in condition for allowance.

Unexamined Claims

As discussed with Examiner Pak in telephone conversations on August 19, 2005 and September 15, 2005, elected claims 23-32 were not examined in the outstanding Office Action. The Examiner instructed Applicants to respond to the rejections of claims 1-20 and stated that claims 23-32 would be examined in a subsequent, non-final, Office Action. Therefore, Applicants base the above amendments and the following remarks on currently examined claims 1-20.

Claim Objections

Claims 7 and 13 stand objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form. As set forth above, Applicants have rewritten claims 7 and 13 in independent form.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-6, 8-12 and 14-20 stand rejected under 35 U.S.C. 35 U.S.C. § 102(b) for asserted anticipation by van den Beukel et al. (Applicants believe that the Examiner is referring to the van den Beukel et al. disclosure, hereinafter "van den Beukel"). The Examiner states that van den Beukel discloses chimeric receptors comprising rat alpha and Drosophila alpha subunits, chicken beta 2 subunits; and nucleic acids encoding the above receptors expressed in oocytes. Additionally, the Examiner states that the chimeric DNA were subcloned into pcDNA3 which inherently requires transformation of the host cell.

Applicants submit that the chimeric subunits disclosed by van den Beukel can be distinguished from the present invention with respect to the sequence segments which are replaced with insect sequences. Specifically, attached herewith is a sequence comparison which identifies the regions in van den Beukel's most extended replacement (designated S7.1, page 1032) in italicized type. The region defined by SEQ ID NO: 1 in Torpedo alpha 1 is written in bold and italicized. Thus, it is clear that the modified acetylcholine receptor subunit of the claimed invention comprising an α subunit of a vertebrate acetylcholine receptor in which the entire

region, which is homologous with the amino acid sequence shown in SEQ ID NO: 1, has been replaced by the corresponding region of an α subunit of an insect acetylcholine receptor is not anticipated by van den Beukel.

Applicants also respectfully submit that the Examiner is incorrect that van den Beukel discloses receptors formed from chimeric subunits containing a Beta 2 subunit. Nowhere in van den Beukel is such a description taught or suggested. Rather, van den Beukel discloses a hybrid receptor consisting of Drosophila α2 subunits and chick β2 subunits (e.g., page 1032, Fig. 1). It is therefore clear that this receptor does not contain chimeric subunits.

Furthermore, the modified receptor subunits produced by van den Beukel are not capable of a functional response to typical acetylcholine receptor ligands such as acetylcholine or physostigmine (see page 1032, Methods and Results: "Neither ACh, Phytoestrogen nor teramethylammonium was able to induce an ion current in any of the chimeras;" also see page 1032, Conclusions: "Lack of function of the alpha7-SAD chimeras appears to be due to deficient coupling of agonist binding to gating of the ion channel..".). The chimeras disclosed by van den Beukel therefore are not suitable for a test method with which it is possible to find compounds which, as modulators, in particular as agonists or antagonists, alter the conduction properties of insect nicotinic receptors.

In contrast to van den Beukel, the chimeric subunits of the claimed invention assemble with β subunits, forming a receptor that responds with increased ion conductance to the binding of acetylcholine or imidacloprid, not only in Xenopus oocytes, but also in cell lines such as Sf9 (Examples 2 and 3 of the application).

Conclusion

In view of the above amendments and remarks, Applicants respectfully request allowance of all pending claims 1, 5-20 and 23-32.

Respectfully submitted,

By _____

Raymond J. Harmuth
Attorney for Applicants
Reg. No. 33,896

Bayer CropScience LP
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-3916
FACSIMILE PHONE NUMBER:
(412) 777-3902

Attachment 2

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                        *         20          *         40          *         60
a1_Human       : ---VAKLFKDYSSVVRPVEDHRQVVEVTVGLQLIQLINVDEVNQIVTTNVRLKQGDMVDL :
57
a1_Torpedo     : ---VANLLENYNKVIRPVEHHTHFVDITVGLQLIQLISVDEVNQIVETNVRLRQ------ :
51
a4_Chick       : ---LKKLFSGYNKWSRPVANISDVVLVRFGLSIAQLIDVDEKNQMMTTNVWVKQ------ :
51
a2_Drosophila  : ---YDDLLSNYNRLIRPVSNNTDTVLVKLGLRLSQLIDLNLKDQILTTNVWLEH------ :
51
a2_Heliothis   : ---YDDLLSNYNRLIRPVDKNNNTVLVKLGLRLSQLIDLNLKDQILTTNVWLEH------ :
51
a3_Heliothis   : ---YDDLLSNYNRLIRPVTNVSDILTVRLGLKLSQLMEVNLKNQVMTTNLWVEQ------ :
51
a2_Myzus       : ---YDDLLSNYNRLIRPVGNNSDRLTVKMGLKLSQIIEVNLRNQIMTTNVWVEQ------ :
51
a3_Drosophila  : ---YDDLLSNYNKLVRPVVNVTDALTVRIKLKLSQLIDVNLKNQIMTTNLWVEQ------ :
51
a1_Heliothis   : ---YDDLLSNYNKLVRPVLNVSDALTVRIKLKLSQLIDVNLKNQIMTTNLWVEQ------ :
51
a3_Myzus       : ---YDDLLSNYNKLVRPVLNNTDPLPVRIKLKLSQLIDINLKNQIMTTNLWVEQ------ :
51
a7_Rat         : RRLYKELVKNYNPLERPVANDSQPLTVYFSLSLLQIMDVDEKNQVLTTNIWLQM------ :
54

                       *         80          *        100          *        120
a1_Human       : PRPSCVTLGVPLFSHLQNEQWVDYNLKWNPDDYGGVKKIHIPSEKIWRPDLVLYNNADGD :
117
a1_Torpedo     : --------------------QWIDVRLRWNPADYGGIKKIRLPSDDVWLPDLVLYNNADGD :
92
a4_Chick       : --------------------EWHDYKLRWDPQEYENVTSIRIPSELIWRPDIVLYNNADGD :
92
a2_Drosophila  : --------------------EWQDHKFKWDPSEYGGVTELYVPSEHIWLPDIVLYNNADGE :
92
a2_Heliothis   : --------------------EWEDHKFKWDPLEYGGVKELYVPSEHIWLPDIVLYNNADGE :
92
a3_Heliothis   : --------------------KWFDYKLQWNPDDYGGVEMLYVPSEHIWLPDIVLYNNWDGN :
92
a2_Myzus       : --------------------EWNDYKLKWNPEDYGGVDTLHVPSEHIWLPDIVLYNNADGN :
92
a3_Drosophila  : --------------------SWYDYKLKWEPKEYGGVEMLHVPSDHIWRPDIVLYNNADGN :
92
a1_Heliothis   : --------------------SWYDYKLSWEPREYGGVEMLHVPSDHIWRPDIVLYNNADGN :
92
a3_Myzus       : --------------------YWYDYKLTWNPDEYGGVEGLHVPSEHVWRPDIVLYNNADGN :
92
a7_Rat         : --------------------SWTDHYLQWNMSEYPGVKNVRFPDGQIWKPDILLYNSADER :
95
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                          *       140         *       160         *       180
a1_Human       : FAIVKFTKVLLQYTGHITWTPPAIFKSYCEIIVTHFPFDEQNCSMKLGTWTYDGSVVAIN :
177
a1_Torpedo     : FAIVHMTKLLLDYTGKIMWTPPAIFKSYCEIIVTHFPFDQQNCTMKLGIWTYDGTKVSIS :
152
a4_Chick       : FAVTHLTKAHLFYDGRIKWMPPAIYKSSCSIDVTFFPFDQQNCKMKFGSWTYDKAKIDLV :
152
a2_Drosophila  : YVVTTMTKAILHYTGKVVWTPPAIFKSSCEIDVRYFPFDQQTCFMKFGSWTYDGDQIDLK :
152
a2_Heliothis   : YVVTTMTKAVLHHTGKVLWTPPAIFKSSCEIDVRYFPFDQQTCFLKFGSWSYDGDQIDLK :
152
a3_Heliothis   : YEVTLMTKATLKYTGEVNWKPPAIYKSSCEINVEYFPFDEQTCFMKFGSWTYNGAQVDLK :
152
a2_Myzus       : YEVTIMTKAILHYTGKVVWKPPAIYKSFCEINVEYFPFDEQTCSMKFGSWTYDGYMMDLR :
152
a3_Drosophila  : FEVTLATKATLNYTGRVEWRPPAIYKSSCEIDVEYFPFDEQTCVMKFGSWTYDGFQVDLR :
152
a1_Heliothis   : FEVTLATKATLNYTGRVEWRPPAIYKSSCEIDVEYFPFDQQTCVMKFGSWTYDGFQVDLR :
152
a3_Myzus       : FEVTLATKAMLHYSGRVEWKPPAIYKSSCEIDVEFFPFDEQTCVMKFGSWTYDGFQVDLR :
152
a7_Rat         : FDATFHTNVLVNASGHCQYLPPGIFKSSCYIDVRWFPFDVQQCKLKFGSWSYGGWSLDLQ :
155


                          *       200         *       220         *       240
a1_Human       : PESDQP----------DLSNFMESGEWVIKESRGWKHSVTYSCCPDTPYLDITYHFVMQR :
227
a1_Torpedo     : PESDRP----------DLSTFMESGEWVMKDYRGWKHWVYYTCCPDTPYLDITYHFIMQR :
202
a4_Chick       : SMHSHV----------DQLDYWESGEWVIINAVGNYNSKKYECCTEI-YPDITYSFIIRR :
201
a2_Drosophila  : HISQKNDKDNKVEIGIDLREYYPSVEWDILGVPAERHEKYYPCCAEP-YPDIFFNITLRR :
211
a2_Heliothis   : HINQK--KGDMVDVGIDLREYYPSVEWDILGVPAERHERYYPCCQEP-YPDIFFNITLRR :
209
a3_Heliothis   : HMDQSP-GSSLVHVGIDLSEFYLSVEWDILEVPATRNEEYYPCCPEP-FSDITFKLTMRR :
210
a2_Myzus       : HISQAP-DSDVIEVGIDLQDYYLSVEWDIMGVPAVRHEKFYVCCEEP-YLDIFFNITLRR :
210
a3_Drosophila  : HIDELN-GTNVVEVGVDLSEFYTSVEWDILEVPAVRNEKFYTCCDEP-YLDITFNITMRR :
210
a1_Heliothis   : HIDEAR-GTNVVELGVDLSEFYTSVEWDILEVPAVRNEKFYTCCDEP-YLDITFNITMRR :
210
a3_Myzus       : HANEVS-GSRVVDVGVDLSEFYASVEWDILEVPAIRNEKYYTCCEEP-YLDITFNITMRR :
210
a7_Rat         : MQEAD----------ISSYIPNGEWDLMGIPGKRNEKFYECCKEP-YPDVTYTVTMRR :
202
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